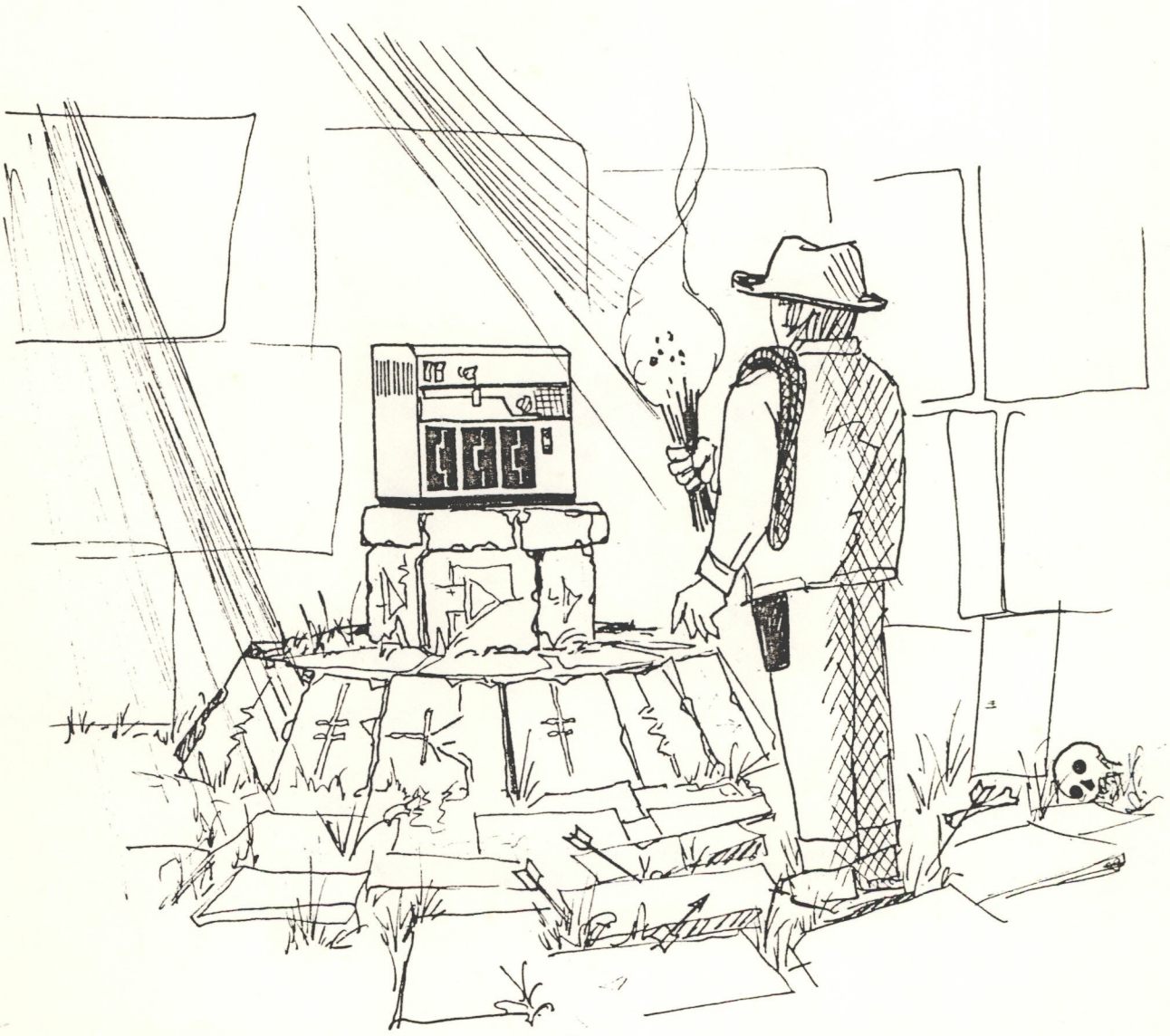
Ye Underground Course 6 Guide



CAVEAT LECTOR

In this course guide we have reviewed all the 6-1 and 6-3 core courses, the 6-3 restricted electives, and a few of the common labs. These reviews are based on the comments written by students on end of the term Course Evaluations (yes, somebody does read them!) as well as on our own experiences and those of our friends. For each course we have recomputed the credit hours to reflect the actual amount of time spent. The first number indicates how many hours a week you can expect to spend in some type of class. This can differ from the registrar's number in either direction. For instance, a course with two lectures and two recitations a week plus optional tutorial could be rated 2 if the recitations are worthless or 5 if the tutorials are a must. The second number is the number of hours per week you can expect to spend in contact with some lab facility, e.g. actual terminal time. The third number indicates the number of hours per week you will spend at home doing problem sets, reading, and lab preparations or write-ups. At the bottom of each page you will find the administrative details of each course: how many tests, problem sets, papers, etc. For problem sets and labs we have indicated how many hours you can expect to spend on each assignment of that type. Thus a 10 hour lab is a lab for which the lab time, write-up time, and time for relevant reading sum to 10 hours total. Also at the bottom of the page we have indicated an approximate grading scheme. In many cases this came straight from the courses formal grading statement. These percentages however are NOT to be taken as the gospel truth and are certainly not official. If we say the final is worth 30% it may, if fact, be worth 40% or only 20%. These published percentages are only to give you a rough idea of the relative weights assigned to each type of work.

VERY IMPORTANT

This guide is in no way, shape, or form attempts to delineate official Course VI policy nor would it care to. We also do not guarantee that the information contained herein is accurate. Much of the material was derived from Fall '81 Course Evaluations and so is at least a year out of date. Professors change their styles, (for better or worse) over time, course notes can improve immeasurably or, conversely, be rewritten and error-filled. The whole structure of courses can change; what used to be a problem sets can be combined into labs, what used to be quizzes can become major tests, etc. We have tried to track down any major changes but chances are we have missed some. This guide is intended to be a compilation of the general hearsay about courses backed with a little objectivity and hindsight and should be used only to obtain a rough idea of what a course is like. A far better way to get the low down on a course is to find people who have taken it recently and talk to them. They can give you far more detail than we can as well as answer questions you have that we might never have thought of. If you should be unable to find such people, please use this guide with skepticism or at least common sense.

- J. Connell, Editor

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Only The Shadow Knows. -- El Hak y su hijo.

6.001: Scheme

(4-8-5) Fall 1982: Abelson

The course is structured around the language Scheme, a dialect of Lisp. It does provide a good background in the fundamentals of computer science, and is adequate preparation for later 6-3 courses. The lecturers (Sussman and Abelson) are considered pretty good; the tutorials, except for Ed Walker's, are highly recommended. The course notes are useful, at the outset anyway; the last third of the course notes are poorly written and incoherent.

A word about the labs: this course has a reputation for inadequate computer facilities. It is fairly common to spend all night in the terminal room, either waiting for a terminal or working on your program (most 6.001 students learn to debug efficiently or perish in the attempt). However, if you are either a careful planner or a programming wizard, you shouldn't have a lot of problems.

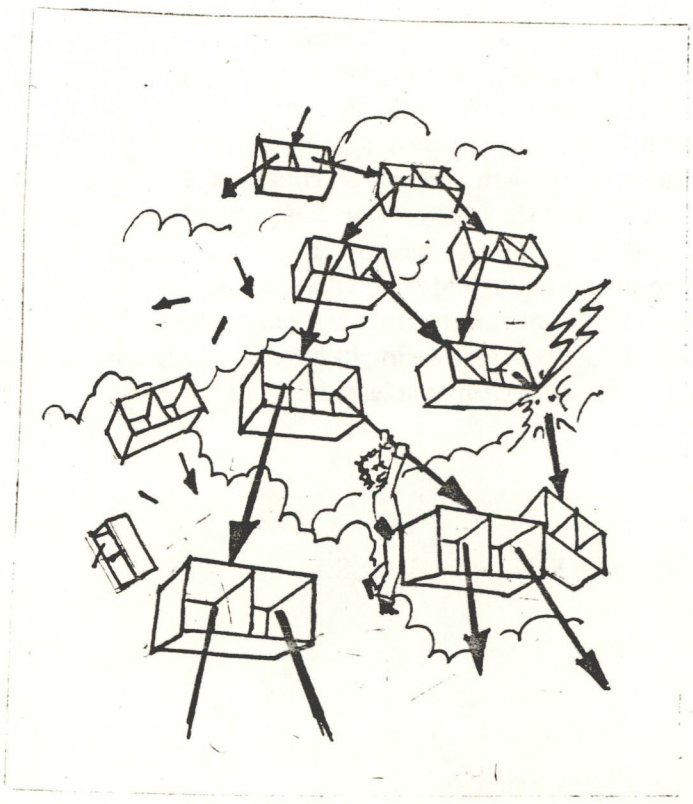
"I don't think I would have gotten through the course with my sanity if there were no tutorials."

"Tutorials: Pat O'Donnell's were very good. Questions were answered in great detail, and confusion was expunged."

"I spent about 25 hours a week on the average [on this course]. Luckily for me, I enjoyed it."

Grade based on:
Final
2 Exams
12 Labs (~10 hours each)

Grading:
30% Final
40% Tests
30% Labs

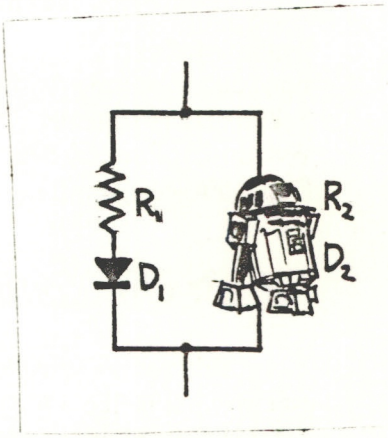


6.002: Introduction to Electronics (4-3-8) Fall 1982: Searle

This course has good lectures with neat demos. Roberge and Senturia especially are good, but Searle tends to be kind of dry. Recitations were generally good as well (particularly Zue and Sastry). This, however, is NOT a good survey course; it IS a good course (and necessary) for EE majors.

So much for the good points. Most people thought that the material was presented in far too theoretical manner, and while lectures were interesting, you actually learned how to do the stuff in recitation (i.e. don't punt them). This course has several short quizzes sprinkled throughout the term. Each recitation instructor makes up his own quiz and these vary widely from instructor to instructor. There were also complaints that there were time pressures on these quizzes, something that was designed to be a 15 minute quiz ended up taking closer to 45. As for the labs; the post-lab exercises tend to be a real pain and if you miss a lab they'll screw you to the wall. A common disease of Course 6 courses crops up here as well: the material needed to do a problem set was not presented, in some cases, until the day before the problem set was due. Another observation made by many was that your grade on the final was your grade for the course.

"Exams were MUCH too long to complete if you had to stop and think about anything. EVERYTHING had to be automatic or else you wouldn't finish."
"Q. What was bad about this course? A. That it's required for 6-3's."
"Why do you give out 13 problem sets and 4 or 5 labs and not use them in grading?"



Grade based on:
Final
5 short (1/2 hr) Quizzes
Weekly 6 hr Problem Sets
4 Labs (about 7 hrs each)

Grading:
50% Final
10% Quizzes
20% PS's
20% Lab

6.003: Linear Systems (4-3-5) Fall 1982: Siebert

Most people thought this was a pretty good course. The material is VERY theoretical but useful. It is irrelevant to CS but relatively painless. The lectures vary in quality: Siebert is *fantastic*, Kennedy is good, and Greschak isn't. The material is cumulative - it is essential that you understand the early stuff before going on. At the end of the term they get into radios and such which most people found very interesting. Unfortunately, at this time there is an end-of-the-term crunch and the course seems to be moving at light-speed.

The labs in this course are interesting, doing the prelabs is absolutely essential for knowing what you are doing in lab. The post-labs, however, are real tough. This course is, as many courses are, run on a set of course notes. The notes for 6.003, however, fall apart about half way through (i.e. the old sections of the notes are dreadful).

"The labs were: build the circuit, take measurements, then answer impossible questions in post-lab."
"Encyclopedia Britannica in one hour!"
*"Siebert's **fantastic**."*

Grade based on:
Final
5 short (1/2 hr) Quizzes
Weekly 5 hr Problem Sets
4 Labs (about 7 hrs each)

Grading:
50% Final
10% Quizzes
20% PS's
20% Labs

6.012: Semiconductor Devices (4-0-7) Fall 1982: Epstein

This course deals primarily with semiconductor physics. Don't let the title fool you, you are taught very little circuit theory - you are expected to know that when you come in (more complex stuff than 6.002). A lot of people would have liked more emphasis on circuits and less on device physics. This is, however, a fairly practical course - you can do something with it afterwards.

This course's workload is fairly heavy and the pace is fast. A lot of people complained that the problem sets were too long and required an excessive amount of number crunching. Another fairly uniform complaint was that the text (Gray and Searle) was not very useful since it was out of date and expensive to boot. The hallmark of this course is the Design Project. This is a problem involving complex circuit design assigned 3 weeks before the end of the term. This must be completed - they refuse to give Incompletes on the basis of the design problem. Yet many people said this was the best part of the course.

"Actually the material was interesting - it's just that the pace was intolerable."
"The design project was an excellent integrating exercise. I learned more from doing it than from anything else so far at MIT. I certainly learned from doing it everything I didn't learn in 6.002."

Grade based on:
Final and Midterm
5 short (1/2 hr) quizzes
Weekly 6 hr Problem Sets
Design Project (= infinite time)

Grading:
30% Final
20% Midterm
20% Quizzes
15% PS's
15 % Design Project

6.013: Quasistatics (5-0-5) Fall 1982: Melcher

This course receives rave reviews. The course teaches what it promises at a pace which is fast but not excessive. It is like a physics course; lots of powerful concepts augmented by a sturdy mathematical background. Yet it is not a physics course in that one does not get buried under math. Also, in contrast to some of physics, you can do real things with the course material. That is, they teach you how to design real equipment.

As far as the running of the course, people said that Haus was an excellent lecturer and very enthusiastic. Melcher is more sedate than Haus, but is very clear. Among the recitation instructors some found Smullin to be confusing but most rated the value of recitations highly. One bad point, however, is that the same examples are used in recitations as are already solved in the notes. The quizzes in this course are trivial: if you know the material you will have no problem. Some thought this was a good idea since they are not trying to screw you on exams but merely seeing if you have understood the material so far. Others didn't like the fact that class average was so high.

"Best organized and taught course I've ever taken at the Institute! Haus is wonderful and really cares about his students. I was highly impressed."
"The primary purpose of the course seemed to be to teach the course material. Tests were very reasonable. Instructors were friendly and good."

Grade based on:
Final
3 Tests
Weekly 5 hr Problem Sets

Grading:
50% Final
50% Tests
+ considerable effect of PS's

6.014: Electromagnetic Waves (5-0-5) Fall 1982: Staelin

This course also receives fine reviews. Lecturers in this course are generally good; Kong is enthusiastic and Staelin is good but goes too fast. A high point of lectures are the demos and movies. The tutorials are considered to be highly useful and worth attending.

The course is run largely on the course notes. Many people, however, feel that the notes need considerable improvement (some action along this line has already been taken). Another complaint was that the material needed to do a problem set was often not covered until the day before the problem set was due. The tests in this course are harder than in 6.013. The official grading policy is worth reading for entertainment. Here it is: Late Homework grades will be weighted by the factor: $| \mathrm{Re}\,(e^{-\alpha t} + j\omega t) |$ for $t > 0$, where t is time measured in hours, $\alpha = 1/96$, $\omega = \pi/24$, and $t = 0$ is set at 4:00 P.M. on Friday when the homework is due.

The term grade G is computed as the magnitude of the complex number $3Q + 5H + j6F$ where Q, F, and H are all no less than zero and no greater than ten; Q represents the total quiz grade, F the final grade, and H the homework and tutorial grade.

"Follows general 6.01X teaching pattern: Snow 'em in lecture, work it out in recitation, figure it out on problem set, and finally understand it in tutorial."
"Kong finally made me believe that 'plun' waves are made up of 'ee' and 'etch' fields."

Grade based on:	***Grading:***
Final	30% Tests
Weekly 5 hr Problem Sets	40% PS's

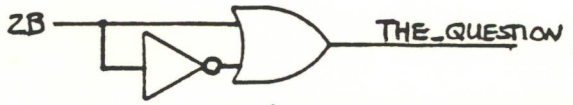
6.032: Computer Hardware (3-0-7) Fall 1982: Ward

The basic material covered by the course is pretty good. 6.032 goes from the transistor to the computer, discussing lower level concepts, such as hardware, microcode, and some digital design. It provides a good background for other courses, particularly 6.111.

There are two exams, of which the first is easy and the second is a killer. The general consensus about the lecturers is that Dertouzos is excellent, Ward is pretty good, but Fredkin is poor. The pace accelerates noticeably about halfway through the course. The lecture notes need a good deal of work; don't miss the lectures (although they're somewhat disjointed), or you'll quickly get lost. The administration of the course is sloppy; corrections to handouts are common and not always prompt.

"The organization and continuity of the course was very poor. It was necessary to teach yourself much of the material."
"Playing musical lecturers really sucks!"
"Fredkin puts me to sleep."
"The first half of the course . . . was well run and interesting. . . . The course notes were some of the worst I have seen. They were at very critical points confusing, poorly edited, error filled, and incompetently written. These need a thorough revision into comprehensible English."

Grade based on:	***Grading:***
Final	40% Final
2 Tests	30% Tests
Weekly 5 hr Problem Sets	30% PS's



6.033: Computer Systems (3-0-8) Fall 1982: Reed

Be prepared to do a lot of reading for this course. Like so many other course VI subjects, there is no text, merely a copious amount of lecture notes, and 6.033 has perhaps more of these than any other course. The notes are in a continual stage of rewrite; if you're reading a section that's just been rewritten, it's not too bad, but if not . . . Some of the supplemental reading is interesting, particularly Brooks' *Mythical Man-Month*, a book you may want to keep after the course is over.

This course involves a lot of writing as well, and in fact works closely with the Writing Program. There are weekly short papers (about a page) based on the reading, and three case studies of five to ten pages each, where the students solve some imaginary system engineering problem. One of each is graded by the Writing Program as well as by your TA; help is available if you have trouble writing.

There is some interesting material in this course; the recitations frequently involve interesting discussions. Too bad Reed is such a lousy lecturer, or the lectures would be interesting too. There is a special quiz period scheduled for the quizzes and for Writing Program lectures.

"Some of the notes are very good, some are very bad, and some haven't even been written yet."
"The lectures were duller than death."
"Tests were designed in such a way that a minor misunderstanding usually resulted in loss of full credit on a problem."

Grade based on:
NO Final
4 Quizzes
Weekly short papers (1 hour)
Two or three case studies (8 hours)

Grading:
25% Quizzes
30% Short papers
25% Case studies
20% Class participation

6.034: Artificial Intelligence (3-0-1) Fall 1982: Winston

6.034 is a course in which the lecturers talk about what they happen to be interested in at the moment. Usually this material is interesting for the students as well, but because of this the topics vary from year to year, and there is no well-defined progression of topics. There is little feedback from the instructors on your progress; the problem sets, which involve a lot of grunge work, are not graded or commented on before the tests. Your grade is based on the midterm and final, period. There are frequent guest lecturers, which people seem to enjoy. The lecturers make frequent use of overhead transparencies but as it is you have to write fast if you want the information in your notes since they do not hand out copies of them.

"This is a thinking man's course: it's very easy to see people getting ***very*** *interested in any or all of the topics introduced."*
"Fascinating, well-presented. All lectures were triple-A star great! I recommend the entire 'Tute take this on listener status, or give it as a series of LSC lectures, or something."
"Problems sets STILL haven't been returned. . . . I never felt involved with the course. The staff attitude was too passive to elicit much of a response."

Grade based on:
Final and Midterm
Three 6 hr Problem Sets

Grading:
50% Final
50% Midterm

6.035: Compilers and Interpreters (2-0-8) Fall 1982: Hammer

It is unfortunate that Mike Hammer is taking a sabbatical; he is perhaps one of the better lecturers in the department. It is hard to say what will happen to the course without him. The course contains a lot of information which, unlike other courses, has some relevance to the outside world. However, one rarely learns anything from the recitations, and little from the lectures; most of what you learn comes from what you had to make up to answer the problem sets.

And speaking of those infamous problem sets . . . Formerly, they involved essay questions, three per week; the answer were expected to contain a lot of detail and be about two pages long each. Last year, a different scheme was tried. Two types of problems were assigned, written and oral. The oral questions were problems from previous years together with their solutions, which the students were expected to discuss and criticize in class on a weekly basis. The written problems were assigned on a weekly-to-biweekly basis, and formed the equivalent of two term projects. One project, for example, involved the implementation of an APL compiler in PDP-10 assembly code! The oral discussions do not seem to be working well, and it is unclear what will be done next year.

The exams are equally infamous; they are true/false and multiple choice questions, but with enormous penalties for incorrect answers to "discourage" guessing (there are always a few students who end up with negative scores), although timid strategies don't seem to work well either. The questions are often purposefully deceptive; watch out for pathological cases and other tricks.

There is a text, but it is not used much; there are innumerable handouts, journal reprints, problem set solutions (generally long and confusing), and the like. WARNING: this course is rumored to be C-centered, so don't treat it lightly!

"This is the first course VI course that's actually taught something useful for computer science."
"Hammer's teaching style resembles driving nails into concrete. Senturia and Siebert could at least soften the brain before deforming it."

Grade based on:
Final and Midterm
Weekly 6 hour written assignments
Weekly oral discussion

Grading:
30% Final
20% Midterm
50% PS's

6.036: Problem Solving Paradigms (2-0-4) Fall 1982: Not Offered

This is purported to be an extension of 6.034 along the lines of predicate calculus, resolution theorem proving, and truth maintenance systems. This can be a great course if you're interested but it is a waste of time if you are not. It is generally a dreadfully taught course with little or no overall structure. Minsky gives "stream of consciousness" lectures while Hewitt has a humorous lecture style but is not very organized. When Szolovitz and Schrobe teach the course it displays a some sense of continuity. Problem sets come out sporadically and vary widely in difficulty. Students from the class are selected to grade various sections of each problem set. At the end of the term there is a paper due on some aspect of the course material. This generally involves a search of the literature and a critique or extension of some specific idea (they give you a list of suggestions).

"I was very discouraged - yet I enjoyed 6.034 immensely."
"You learn more from researching the term paper than from the whole rest of the course."

Grade based on:
NO Final
NO Tests
3 Problem Sets (2 to 12 hrs each)
Term Paper

Grading:
60% Term Paper
40% PS's

6.041: Probability (4-0-7) Fall 1982: Drake

When Drake lectures this course, it is excellent. Without him . . . Fortunately, you can still see him on the video tapes, which are useful for reviewing the material; there is usually a rush to use them just before quizzes, so plan ahead. The problem sets are graded on a statistical basis, i.e. one or two problems are selected at random and graded. There is an optional third quiz, if you're going down the tubes. The tutorials are mandatory, but they're also quite useful. This is a well organized course, both in the material covered and in the administration. 6-3's will find nothing in it pertinent to their major, but will not mind taking it anyway.

"Denny Freeman is the most boring, uninspiring, and incomprehensible lecturer I've had in all my career at MIT."
"Last year's problem set solutions were not clear enough to copy."
"Drake is the type of lecturer who can make this totally boring material seem interesting and entertaining."
"All these years and Oscar has yet to find his dog. That's going against the odds for you."

Grade based on:
NO Final
3 Quizzes plus one optional
Weekly 4 hr Problem Sets

Grading:
50% Quizzes
50% PS's

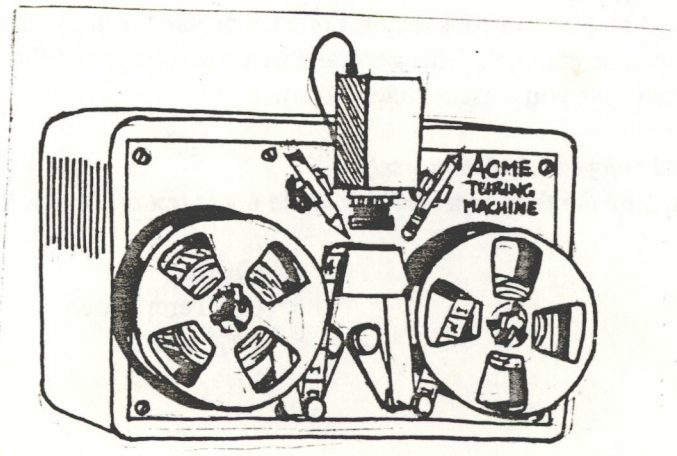
6.045: Formal Study of Automata (3-0-5) Fall 1982: Sipser

This is MIT's version of *Godel, Escher, Bach.* This is definitely a math course (joint with 18.420) and as such you end up writing a lot of proofs. The course begins slowly but after the middle of the term it goes too fast. Problem sets used to be very long but now they are shorter and they are graded by students in the course, a very unpopular idea. Lectures are definitely worth attending as Sipser is a coherent lecturer with good delivery and quizzes tend to be taken straight from the lectures.

"This course was particularly good for people who like to diddle with mathematical concepts, proving all sorts of things by being intuitively clever."
"Sipser takes his lectures straight from the book. Luckily, he can still get people to come to class by taking his quizzes straight from his lectures."

Grade based on:
Final
2 Tests
Weekly 5 hr Problem Sets

Grading:
25% Final
50% Tests
25% Problem Sets



6.046: Algorithms (3-0-8) Fall 1982: Rivest

This is the "order of" (n, log n, n^2, . . .) course. It covers standard computer techniques such as: sorting and searching, manipulation of data structures, graph algorithms, etc. It also covers the traveling salesman problem and NP completeness among others and, needless to say, has a lot of proofs. There was good continuity from one lecture to another and the lecturer (Rivest), although a little dull, will answer questions in class.

This is another of the courses that often has student grading, that is, people in the class grade the problem sets. Student grading was almost universally disliked; people thought there should have been a larger staff to handle such things. The problem sets are long and hard and the questions are often intentionally ambiguous. The tests are take-homes and are much longer and harder than the problem sets (sounds great doesn't it?). The final is often a take-home as well and is tough. A big complaint was that there are multiple text books for this course which can add up to megabucks.

"If you see the answer immediately it is real easy, if you don't you spend a lot of time looking for the right trick."

"Exams were infinitely more difficult than homework, either make one easier or the other harder to match."

Grade based on:
Final
2 Exams
Weekly 10 hr Problem Sets

Grading:
30% Final
30% Exams
40% PS's

6.088: Robotics (3-0-5) Fall 1982: Horn

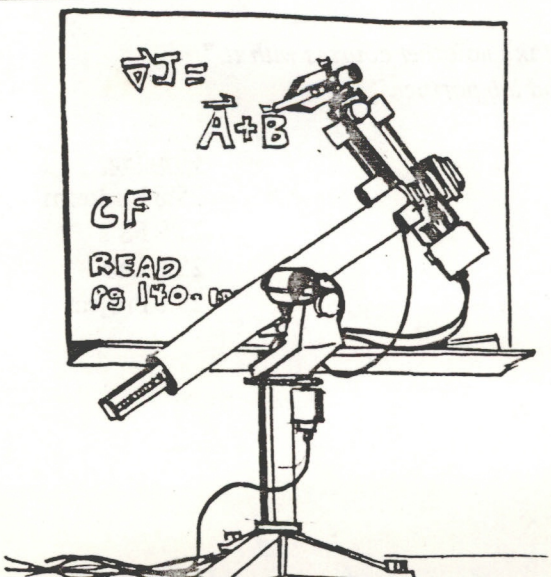
The course covers manipulators and vision but tends to concentrate on the dullest and grungiest portions of these topics. The manipulation portion of the course has matrices galore and uses a lot of control theory. The vision portion is interesting until it, too, turns to math. Horn talks primarily about what he himself has done and as a lecturer is unenthusiastic. People wanted more theory such as obstacle avoidance and gripper design and less on dynamics and control. Both the midterm and the final are long take-home problem sets.

"The concepts were interesting; the math was a pain."

"B.K.P. Horn is a prime example of artificial intelligence."

Grade based on:
Final and Midterm
Weekly 5 hr Problem Sets

Grading:
25% Final
25% Midterm
50% PS's



6.101: Analog Lab (1-4-1) Fall 1982: Paton

This is the department's basic analog lab. The TA's in this course are good but the lecturer (Paton) is not. He is poorly organized and does not get any concepts across. Fortunately you can ignore him. The assigned labs are reasonably coherent and if you know anything about electronics you should have no trouble with them. In the second half of the term there is a design project which is generally not as complex as the projects in 6.111. Seeing as the second half is basically the design project, recitations end about half way through the term although the TA's are always available.

"... if you want an easy lab..."
"After several weeks the TA's gave up trying to correct the lecturer."

Grade based on:
NO Final
3 Tests
5 Labs (about 10 hrs each)
Design Project

Grading:
25% Tests
25% Labs
50% Project

6.111: Digital Lab (First 2/3: 2-6-2) Fall 1982: Troxel

Second 1/3: 0-12-18

This course is designed to introduce digital design techniques. It is a crash course in how to debug digital circuits. The key word there is 'crash' since the final project requires 24-hour attention. 6.111 is an excellent course, if you have any knack for digital design, you can pick up enough experience in this course alone to get a job doing digital design. However, if you can't figure out how to debug a circuit you are going to be very lost, and no one will be able to teach you how to get a circuit to work.

The course is primarily a lab course, the first half of the course consists of four labs designed to introduce you slowly(?) to the techniques involved. The first lab is a thirty second warm-up, but don't be fooled; the fourth lab requires about twenty lab hours just to debug assuming your original design is workable. The second part of the course is the famous final project. The goal is to select a partner and, working as a team, design and demonstrate a digital system of your own choosing. If you survived the course this far, the final project can be fun. You are free to select any type of project you want including video games, microcomputers, and music synthesizers. But be forewarned, you must use only the basic chips (i.e. no microprocessors). The course also has lectures, but most of the material in the lectures is a rehash of 6.032.

6.111 is an excellent lab course; however, be prepared to spend the last two weeks of the term in lab. If you complete your final project and can get it to work while a TA is watching, you are guaranteed to get a good grade. However, if you can't get your final-project to work your grade will be at the mercy of how well you did on the first four labs and on the one test. There are NO incompletes given in this course.

"The ideal way to take 6.111 is to take no other courses with it."
"It is vitally important to get a good lab partner."

Grade based on:
Midterm
Five 3 hr Problem Sets
4 labs
Final project

Grading:
25% Midterm
25% PS's
25% Lab
25% Project

6.114: Real-Time Computing (3-9-1) Fall 1982: Musicus

This is the first of a two-course sequence 6.114 - 6.115. It deals mainly with writing programs in PASCAL and assembly language to control external devices interfaced with a PDP-11 microcomputer. At the end of the course, students should be an expert in the RT-11 operating system. Most students find this course very interesting, and the labs relevant and useful in industry. Professor Lee is a very enthusiastic lecturer.

However, labs are tremendous time sink, and they account for most of the final grade. TA's and LA's are helpful, but they are not enough. Lab facilities are closed after 10 and are not open on weekends.

There is no textbook for this course. The Lab Users Handbook and the reference texts cover only some of the topics required for the labs. Using the manual is quite a pain. Students also find that lectures relevant to a lab are given too close to the lab due date.

"Rewrite, or perhaps write for the first time, a set of course notes."
"A text, or notes, that more closely parallels the progression of the material."
"I have felt that there was so much work it interferes with the appreciation and understanding. The semester turns into a series of overwhelming problem sets."
"One less machine problem would have made the course more bearable."

Grade based on:
3 short (15 min) quizzes
6 Machine Problem Sets

Grading:
10% Quizzes
90% Machine Problems

6.170: Big Program Engineering (3-10-6) Fall 1982: Liskov

This course is designed to teach the principles of good programming and documentation practice ("software engineering") through use of the programming language CLU. Hackers will like this language; it has some nice features. Unfortunately, you won't get much chance to hack in this course; the assigned machine problems are (possibly excepting the first couple) long and complicated. Combining this with the usual speed of the EECS machine, you should plan to spend a lot of time in 38-344, particularly in the middle of the night. This holds especially true for the final project; the amount of work expands to fill all available time. Getting a responsible lab partner to work with is vitally important.

Administratively, the course (like many others) is slow. Of the recent lecturers, Liskov is interesting when the material is interesting, Guttag not even then. Brian Oki is a good recitation instructor, but demands more from his students than other TAs.

"[Warning -- disk space full on PS:]
[Deleted files will be expunged in 30 seconds]"
"Even though I may get an A in this course, taking it has destroyed my G.P.A. I have little time to spend on other classes."
"CLU is a great language!"
"One does learn to regard programming as engineering!"

Grade based on:
Final and Midterm
4 machine problems (15 hours)
Final project (= infinite time)

Grading:
30% Tests
35% Labs
35% Project